CLAIMS

We claim:

1. An acousical ceiling diffuser element comprising:

a frame,

a plurality of equally spaced paddles secured to the frame,

said frame adapted to be installed between a pair of ceiling joists;

said paddles secured at an angle of between about 15° and about 40° from horizontal and

said paddles all secured at the same angle.

2. The acousical ceiling diffuser element of claim 1 wherein the paddles are all angled the same direction.

3. The acousical ceiling diffuser element of claim 1 wherein the paddles are angled between about 30° to about 35° from horizontal.

4. The acousical ceiling diffuser element of claim 1 wherein the paddles are angled about 35° from horizontal.

5. The acousical ceiling diffuser element of claim 2, wherein

said frame has a first end and a second end,

said plurality of paddles each having an upper end and a lower end,

the upper end of a first paddle is substantially aligned with the first end of said frame,

the lower end of a last paddle is substantially aligned with a second end of said frame, and

the upper end of the paddles is substantially aligned with the lower end of the adjacent paddle.

6. The acousical ceiling diffuser element of claim 5 wherein the element has a depth greater than about 4 inches.

7. The acousical ceiling diffuser element of claim 6 wherein the paddles are 12 inches apart.

8. The acousical ceiling diffuser element of claim 7 wherein the length of the element is 48 inches, the width is 14 ½ inches and the depth is 5 inches.

9. The acousical ceiling diffuser element of claim 7 wherein the element is adapted to be separated between said paddles.

10. The acousical ceiling diffuser element of claim 5 wherein the frame and paddles are made of non-absorptive material, minimally absorptive material, semi-absorptive material, or combinations thereof.

11. The acousical ceiling diffuser element of claim 10 wherein the frame and paddles are made of plastic or wood.

12. The acousical ceiling diffuser element of claim 10 wherein the paddles are integral with the frame.

13. The acoustical ceiling diffuser element of claim 2 wherein the frame comprises a base and two side walls.

14. An acousical ceiling diffuser comprising:

a plurality of joists in a ceiling, and

a plurality of paddles secured in cavities formed between adjacent joists,

said ceiling having an imaginary centerline perpendicular to said joists,

said paddles secured at an angle of between about 15° and about 40° from horizontal and said paddles all secured at the same angle,

said plurality of paddles comprising a plurality of first side center paddles, a plurality of second side center paddles and a plurality of remaining paddles.

15. The acousical ceiling diffuser of claim 14 wherein

each paddle has an upper end and a lower end,

one first side center paddle is installed on one side of the centerline and one second side center paddle is installed on an opposite side of the centerline such that at the centerline either an upper end of the one first side center paddle is adjacent to an upper end of the one second side center paddle or a lower end of the one first side center paddle is adjacent to a lower end of the one second side center paddle, and

said remaining paddles are installed with the paddles angled in the same direction as the adjacent paddle.

16. The acousical ceiling diffuser of claim 15 wherein in adjacent cavities the pattern of paddles is reversed such that at the centerline the upper ends of the

center paddles are adjacent and at the centerline in the adjacent cavities the lower ends of the center paddles are adjacent.

17. The acousical ceiling diffuser element of claim 16 wherein the paddles are angled between about 30° to about 35° from horizontal.

18. The acousical ceiling diffuser element of claim 16 wherein the paddles are angled about 35° from horizontal.

19. The acousical ceiling diffuser element of claim 16 wherein the diffuser has a depth greater than about 4 inches.

20. The acousical ceiling diffuser of claim 16 wherein the paddles are 12 inches apart.

21. The acoustical ceiling diffuser of claim 14, further comprising a layer of sound absorptive material above the paddles.

22. The acoustical ceiling diffuser of claim 14, further comprising a layered construction of:

a first sheetrock layer,

a sound deadening material layer,

a high frequency sound absorptive material layer,

wherein the sheetrock layer is attached to the joists, and

the sound deadening material and the absorptive material are attached to the sheetrock, and

the paddles are attached below the layers.

23. The acoustical ceiling diffuser of claim 22 further comprising insulating material between the joists above the sheetrock layer.

24. The ceiling diffuser of claim 14 further comprising acoustically neutral fabric covering the ceiling.

25. A method of installing an acousical ceiling diffuser comprising the steps of:

obtaining a plurality of acousical ceiling diffuser elements comprising a frame and a plurality of angled paddles, each said paddle having a upper side and a lower side;

installing the acousical ceiling diffuser element between pairs of ceiling joists in a symmetrical pattern about an imaginary centerline running perpendicular to the joists.

26. The method of claim 25 further comprising the steps of:

installing a first acousical ceiling diffuser element between a pair of ceiling joists at a first side of the imaginary centerline,

installing a second acousical ceiling diffuser element at the opposite side of the imaginary centerline between the pair of joists, such that at the centerline an upper side of a first paddle of the first acousical ceiling diffuser element is adjacent to an upperside of a first paddle of the second acousical ceiling diffuser element to form an inverted V-shape or such that at a the centerline a lower side of a first paddle of the first acousical ceiling diffuser element is adjacent to a lower side of a first paddle of the second acousical ceiling diffuser element to form a V-shape;

installing additional acousical ceiling diffuser elements between the pair of joists such that the paddles angle the same direction as the paddles in the adjacent acousical ceiling diffuser elements;

repeating the steps of installating acousical ceiling diffuser elements between the remaining pairs of joists, and

alternating the V-shape, inverted V-shape between adjacent joists.

27. The method of claim 26 further comprising the step of continuing installing acousical ceiling diffuser elements from the centerline to the wall.

28. The method of claim 27 further comprising the step of:

cutting the acousical ceiling diffuser elements to be installed closest to the wall to an appropriate length.

29. The method claim 27, comprising the additional step of:

covering the ceiling with acoustically neutral fabric.

30. The method of claim 29 comprising the step of installing a plurality of acoustically neutral fabric panels.